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EXAMINER

ELLIS, RICHARD L

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/458,570

Applicant(s)

RODGERS ET AL.

Examiner

Richard Ellis

Art Unit

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-30 and 32-36 is/are rejected.
- 7) ☒ Claim(s) 14 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,6-12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

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1. Claims 1-36 are presented for examination.

2. The following is a quotation of the appropriate paragraphs of 35 USC § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 USC § 103 which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

4. This application currently names joint inventors. In considering patentability of the claims under 35 USC § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 USC § 102(f) or (g) prior art under 35 USC § 103.

5. Claims 1-13, 15-30, and 32-35 are rejected under 35 USC § 102(e) as being anticipated by Nation et al., U.S. Patent 6,233,599.

Nation et al. taught (e.g. see figs. 1A-9B) the invention as claimed (as per claim 1), including a data processing ("DP") system comprising:

5.1. maintaining a state machine (fig. 3A, 80) to provide a multi-bit output (86), each bit of the multi-bit output indicating a respective status of an associated thread of multiple threads being executed with a multithreaded processor (col. 9 lines 5-25);

5.2. detecting a change of status for a first thread within the multithreaded processor (fig. 5, 515); and,

5.3. configuring a functional unit within the multithreaded processor in accordance with the multi-bit output of the state machine (fig. 5, 525, 545, col. 13 lines 31-45 and line 57 to col. 14 line 3).

6. As to claim 2, Nation et al. taught that each bit of the multi-bit output indicated the status of the associated thread as being active or inactive (col. 9 lines 5-37, where "READY" == active, "NOT-READY" == inactive).

7. As to claim 3, Nation et al. taught that configuring of the function unit comprised

partitioning the functional unit to service both the first thread and a second thread within the multithreaded processor when the change of status for the first thread comprised a transition from an inactive state to an active state (col. 7 line 25 to col. 8 line 30).

8. As to claim 4, Nation et al. taught that the configuring of the functional unit comprised un-partitioning the functional unit to service a second thread, but not the first thread, within the multithreaded processor when the change of the status of the first thread comprised a transition from an active state to an inactive state (col. 7 line 25 to col. 8 line 30).
9. As to claim 5, Nation et al. taught that the detecting of the change in status of the first thread comprised detecting the occurrence of an event for the first thread (fig. 5, 515, col. 13 lines 15-20).
10. As to claim 6, Nation et al. taught asserting a first signal responsive to the occurrence of the event for the first thread (fig. 5, 515), and evaluating the state machine during the assertion of the first signal (fig. 5, 535).
11. As to claim 7, Nation et al. taught that the functional unit within the multithreaded processor was configured, in accordance with the multi-bit output of the state machine, on the de-assertion of the first signal (fig. 5, 525, 545).
12. As to claim 8, Nation et al. taught that detecting of the change in the status of the first thread comprised detecting the occurrence of a sleep event for the first thread that transitions the first thread from an active state to a sleep state (col. 13 lines 15-20).
13. As to claim 9, Nation et al. taught responsive to the detecting of the occurrence of the sleep event, setting an inhibit register to inhibit an event that is not a break event for the sleep state of the first thread (col. 13 lines 46-57).
14. As to claim 10, Nation et al. taught that the configuring of the functional unit within the multithreaded processor comprised saving and deallocating state within the multithreaded processor for the first thread (fig. 5, 525).
15. As to claim 11, Nation et al. taught that the saving and deallocating of the state within the multithreaded processor for the first thread comprised recording the state for the first thread


within a memory resource (col. 13 lines 30-41).

16. As to claim 12, Nation et al. taught that the configuring of the functional unit within the multithreaded processor comprised making registers, within a register file of the multithreaded processor, available to a second thread within the multithreaded processor (col. 7 line 25 to col. 8 line 30).
17. As to claim 13, Nation et al. taught that the functional unit comprised any one of the group of functional units including a memory order buffer, a store buffer, a translation lookaside buffer, a reorder buffer, a register alias table, and a free list manager (fig. 1A, 24, 22).
18. As to claim 15, Nation et al. taught that configuring the functional unit included restoring state within the multithreaded processor (fig. 5, 545).
19. As to claim 16, Nation et al. taught that the detecting of the change in the status of the first thread comprised detecting the occurrence of a break event for the first thread that transitions the first thread from a sleep state to an active state (fig. 5, 530, col. 13 lines 45-58).
20. As to claim 17, Nation et al. taught detecting a third event for the first thread that does not constitute a break event, and logging the third event within a pending register associated with the first thread (col. 15 lines 45-57).
21. As to claims 18-30 and 32-35, they do not teach or define above the invention claimed in claims 1-13 and 15-17 and are therefore rejected under Nation et al. for the same reasons set forth in the rejection of claims 1-13 and 15-17, supra.
22. As to claim 29, Nation et al. taught that the configuration logic associated with the functional unit makes registers, within a register file of the multithreaded processor, allocated to the first thread available to a second thread within the multithreaded processor if the first thread exits and makes registers, within the register file of the multithreaded processor, allocated to the second thread available to the first thread within the multithreaded processor if the second thread exits (col. 7 line 25 to col. 8 line 30).
23. Claim 36 is rejected under 35 USC § 103 as being unpatentable over Nation et al., U.S.

Patent 6,233,599, as applied to claims 1-13, 15-30, and 32-35, supra.

24. As to claim 36, Nation et al. did not teach a machine readable medium containing a sequence of instructions to perform the claimed method. However, it is well known that hardware and software operations are equivalent and official notice of such is hereby taken. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have implemented Nation et al.'s method in software because doing so would have provided an advantage of easy updating of the system for the correction of design flaws (or bugs) and for providing additional extensions to the system not foreseen by Nation et al. at the time of his invention. Such software would inherently have consisted of a sequence of instructions for the machine, and would have inherently been stored upon a machine readable media.
25. Claims 14 and 31 are objected to as being dependent upon a rejected base claim, but would render the base claim allowable if bodily incorporated into the base claim such that the new base claim included all of the original limitations of the base claim, any intervening claims, and the objected claim.
26. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.
27. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) days from the mail date of this letter. Failure to respond within the period for response will result in **ABANDONMENT** of the application (see 35 USC 133, MPEP 710.02, 710.02(b)).
28. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Richard Ellis whose telephone number is (703) 305-9690. The Examiner can normally be reached on Monday through Thursday from 7am to 5pm.
- If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Eddie Chan, can be reached on (703) 305-9712. The fax phone numbers for this Group are: After-final: (703) 746-7238; Official: (703) 746-7239; Non-Official/Draft: (703) 746-7240.
- Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Richard Ellis  
August 11, 2003



**RICHARD L. ELLIS**  
**PRIMARY EXAMINER**